



Indicators of Environmental Quality

Hawai'i Department of Health
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Document Notes

This report includes a selection of twenty-one environmental indicators, each occupying a single page. Each indicator shows a data set, a chart based on those data, and a discussion of the indicator and the data upon which it is based. Only data collected by, through or about Hawai'i Department of Health programs are included.

The discussion accompanying each indicator is separated into five sections:

Explanation: The first section explains the data and chart, focusing on the fundamental picture portrayed by the chart. Terms and caveats are also discussed in this section.

Implications: An 'Implications' section follows, with a short and sometimes subjective discussion of what impact the indicator findings may have on public health and the environment, and therefore on the Department of Health's (DOH) environmental programs.

Data Quality: The third section provides a one-word assessment of data quality for the indicator. Data quality is ranked as either High (\pm 5-10% confidence), Medium (\pm 10-25 % confidence), or Low (\pm 25-50% confidence).

Environmental Indicator: a tool which uses best available data to measure the quality of the environment and/or progress made in protecting the environment.

The last two discussion sections note the source of the data and comment on whether the data are required of DOH by the Environmental Protection Agency (EPA).

In most cases, when a percentage scale is used in a chart the scale ranges from 0 to 100 percent. To more clearly show trends, some chart scales extend from values of 50 % or 75% to 100%.

Data used are organized on a federal fiscal year (FFY) calendar unless otherwise noted, and usually cover the years 1996-2000 in order to show a five-year trend for each indicator. Some indicators do not have data available for that period, and some provide only a 'snap shot' of information for a single year.

Acronyms

CAB	-Clean Air Branch
CWB	-Clean Water Branch
DOH	-Department of Health
EPA	-U. S. Environmental Protection Agency
EPO	-Environmental Planning Office
NRIAQB	-Noise, Radiation & Indoor Air Quality Branch
OSWM	-Office of Solid Waste Management
SDWB	-Safe Drinking Water Branch
SHWB	-Solid & Hazardous Waste Branch
WWB	-Wastewater Branch

Multi-Program Indicator

Toxics Release Inventory into Hawai'i's Air, Water, and Land

Explanation: Overall releases of toxic compounds into Hawai'i's air, water and land are declining. Releases to water and injection wells, and off-site transfers have been dramatically reduced since 1995. While air emissions have not decreased significantly, Hawai'i has very clean air.

Implications: The declining trend in toxic releases is positive as air, water and land are all environmentally connected. Further declines in legal releases would be beneficial, however they are not expected.

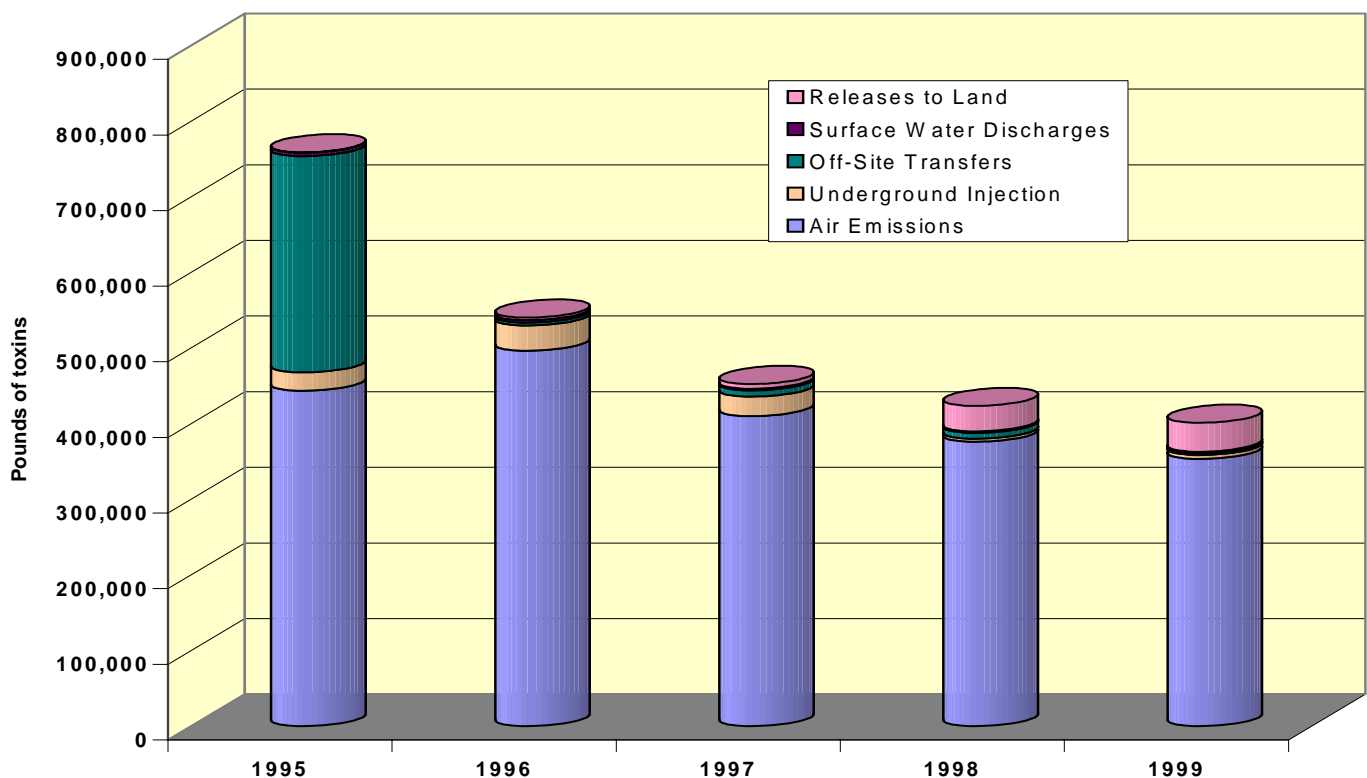
Data Quality: Medium (± 10-25 %confidence).

Source: EPA's Toxic Release Inventory (available on EPA's web site.)

Data are not required of DOH by EPA, but EPA does require these data from private industries.

Toxic Release Data (in pounds)					
FFY	Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Off-Site Transfers
1995	443,607	4,510	24,306	545	285,905
1996	496,508	3,265	33,209	3,290	3,995
1997	409,983	2,119	25,750	6,188	8,365
1998	376,116	2,057	3,849	33,634	7,768
1999	353,488	2,489	5,065	38,098	1,993

Toxic Releases in Hawai'i (in pounds)



Ambient Levels of Sulfur Dioxide Compared to National Standards

Explanation: The national standard for sulfur dioxide (SO₂) concentrations was set by EPA at 80 micrograms/cubic meter (µg/m³) as the annual average limit of SO₂ in ambient air. The Honolulu air monitoring station is located atop the DOH building downtown. Data from this station are shown here as representative of SO₂ concentrations in Hawai'i. The results show that the annual average over the past five years, 1-3 µg/m³, has been roughly 97% below the standard.

Implications: Hawai'i's annual average SO₂ concentrations are very low compared to the national standard. On persistent Kona wind days, volcanic emissions from the island of Hawai'i can be transported to Oahu and are experienced mostly as sulfates (SO₄). These sulfates are included in the PM₁₀ (particulate) category expressed on the next page.

Data Quality: High (± 5-10% confidence).

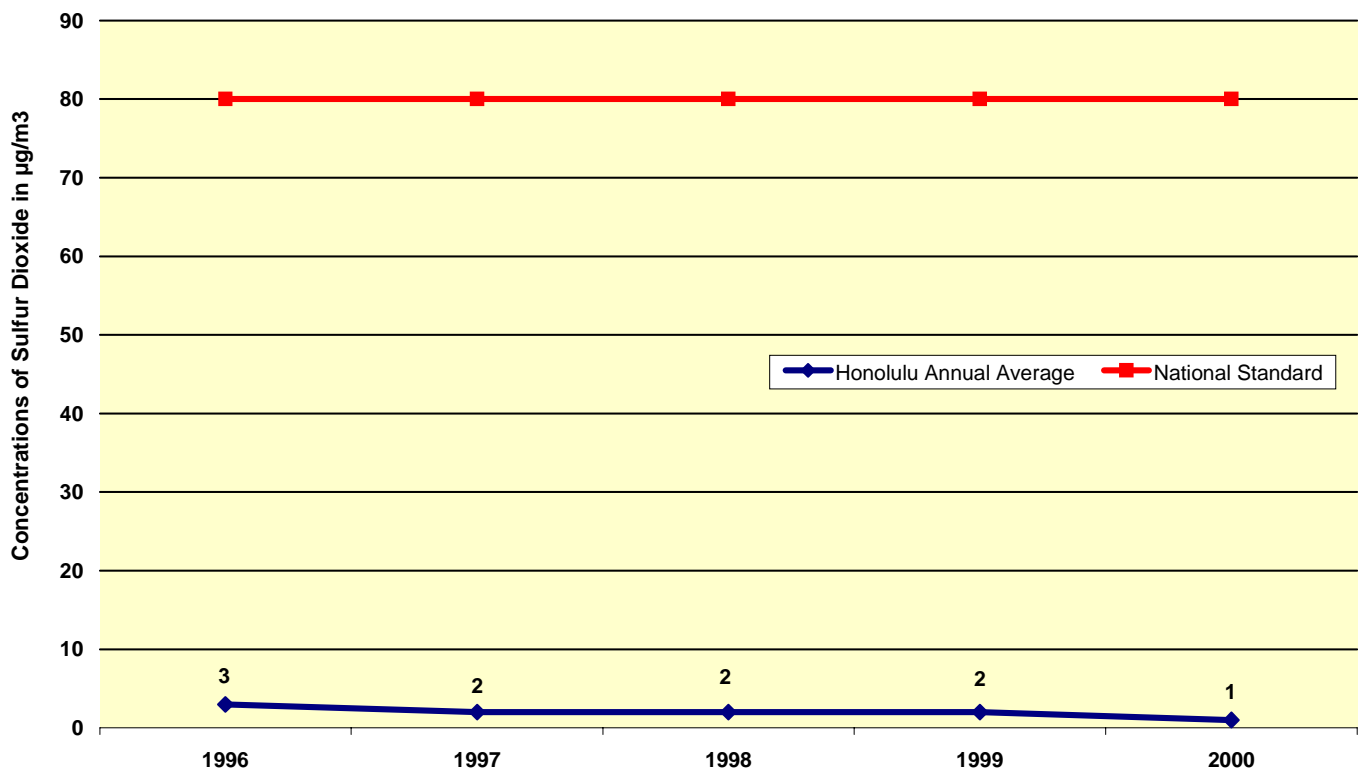
Source: DOH Clean Air Branch.

Data are required by the EPA.

Sulfur Dioxide Data

FFY	Honolulu Annual Average of SO ₂ (µg/m ³)	National Standard for SO ₂ (µg/m ³)
1996	3	80
1997	2	80
1998	2	80
1999	2	80
2000	1	80

Hawai'i's Annual Average Sulfur Dioxide Levels (Honolulu Station) Compared to the National Standard



Ambient Levels of Air-borne Particulates Compared to National Standards

Explanation: The EPA has set the annual average of the particulate matter, or PM₁₀, at 50 micrograms/cubic meter ($\mu\text{g}/\text{m}^3$). PM₁₀ is defined as particles with an aerodynamic diameter less than or equal to 10 microns. At the Honolulu monitoring station, located in the heart of downtown, the annual average concentration of particulates varied from 8 to 14 $\mu\text{g}/\text{m}^3$. At 14 $\mu\text{g}/\text{m}^3$ this annual average is 72% below EPA's standard.

Implications: The concentrations measured in Honolulu are far below the national standard. The visual trend line shows that, within the past 5 years, the particulate levels dropped to a low of 8 $\mu\text{g}/\text{m}^3$ in 1997, and then slowly returned to 14 $\mu\text{g}/\text{m}^3$. PM₁₀ concentrations are not significantly affected by sulfates from volcanic emissions carried over O'ahu by Kona winds.

Data Quality: High (\pm 5-10% confidence).

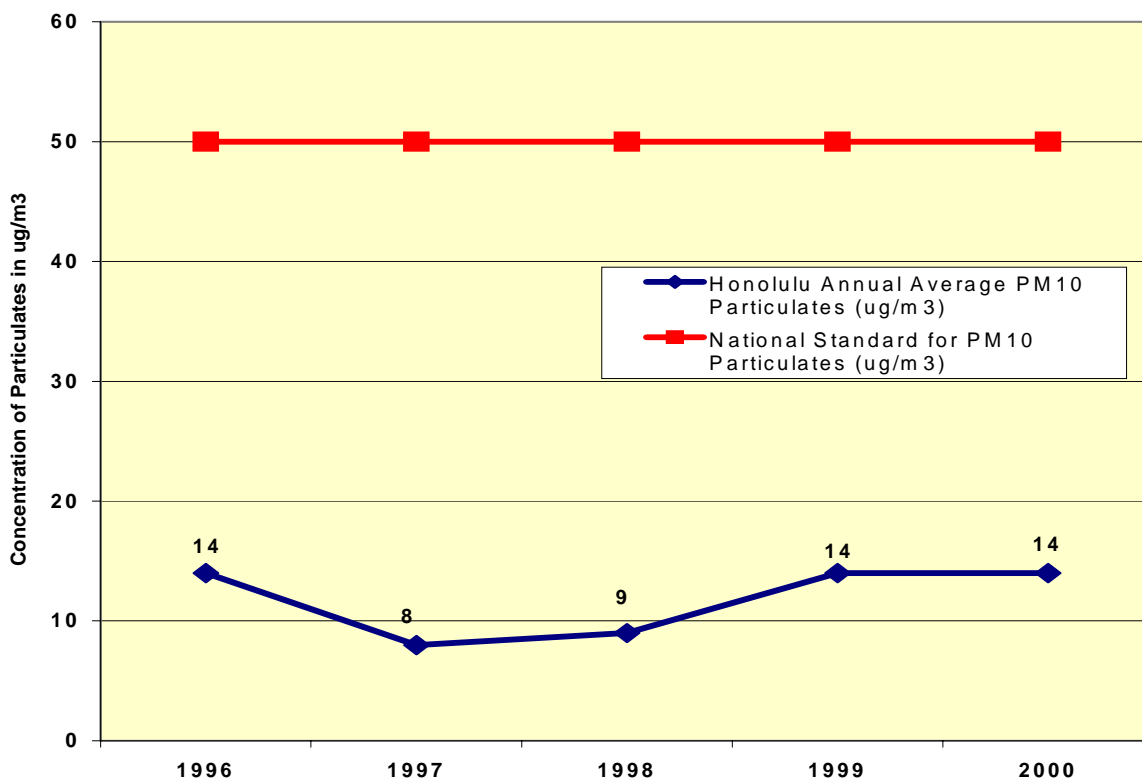
Source: DOH Clean Air Branch

Data are required by the EPA.

Air-borne Particulates Data

FFY	Honolulu Annual Average of PM ₁₀	National Standard for PM ₁₀
1996	14	50
1997	8	50
1998	9	50
1999	14	50
2000	14	50

Hawai'i's Annual Average Particulate Level (Honolulu Station) Compared to the National Standard



Ambient Levels of Carbon Monoxide Compared to National Standards

Explanation: EPA set the 1-hour average limit for carbon monoxide (CO) concentrations in ambient air at 40,000 $\mu\text{g}/\text{m}^3$. This indicator reflects CO data measured at the Honolulu monitoring station located in the heart of downtown, an area with heavy automobile traffic. The CO measurement differs from the other indicators in this report as it reflects a 1-hour average each year rather than an annual average. The maximum 1-hour average is obtained by calculating the arithmetic mean of the highest 1-hour value recorded daily. In addition to the 1-hour national standard, EPA has set an 8-hour standard for CO at 10,000 $\mu\text{g}/\text{m}^3$. Hawai'i recorded 8-hour values are also well below the national standard.

Implications: CO has been on the decline from the five year high recorded in 1998. In 2000 the highest 1 hour average was 3,990 $\mu\text{g}/\text{m}^3$.

Data Quality: High (\pm 5-10% confidence).

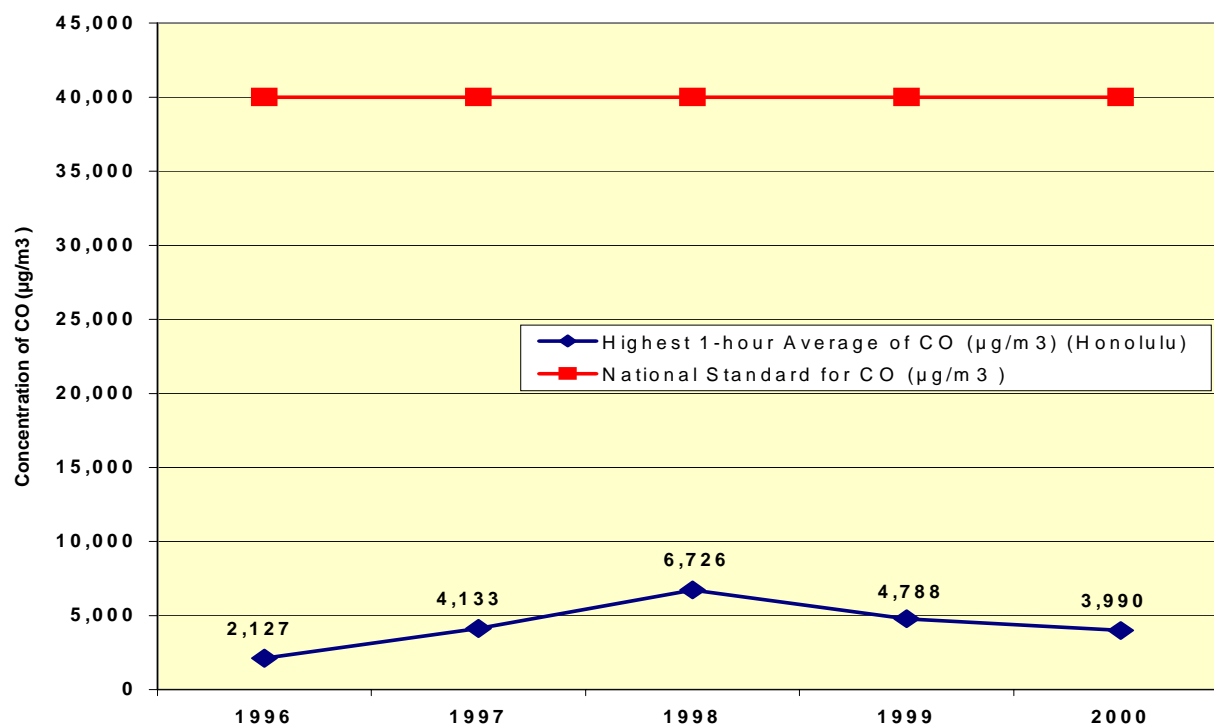
Source: DOH Clean Air Branch

Data are required by the EPA.

Carbon Monoxide Data

FFY	Highest 1-hour Average of CO ($\mu\text{g}/\text{m}^3$) (Honolulu)	National Standard for CO ($\mu\text{g}/\text{m}^3$)
1996	2,127	40,000
1997	4,133	40,000
1998	6,726	40,000
1999	4,788	40,000
2000	3,990	40,000

Hawai'i's Highest 1-hour Average for Carbon Monoxide (Honolulu Station) Compared to the National Standard



Percentage of Schools Contacted Regarding the Indoor Air Quality "Tools for Schools" Program

Explanation: Indoor air pollution has been consistently ranked among the top five environmental risks to public health in comparative risk studies conducted by the EPA and its Science Advisory Board. In 1992, the Hawai'i Environmental Risk Ranking study ranked indoor air pollution as the top risk to human health in Hawai'i. The Hawai'i state legislature established an indoor air pollution program within the DOH in response to this finding. Funding for the DOH Indoor Air Quality Program is provided by EPA. A major element of the EPA workplan is the promotion of the "Tools for Schools" program. Through this program 'action kits' are distributed to willing personnel in schools with grades K-12. Since 1996 when this effort began, 41% of the total schools targeted have received the action kits.

Implications: Typical indoor air quality problems in schools include noise; heat; humidity; mold and mildew; intrusive outdoor air pollutants; and lack of adequate ventilation. Such conditions may impact the productivity of students and teachers and may exacerbate illnesses.

Data Quality: Medium (± 10 -25% confidence).

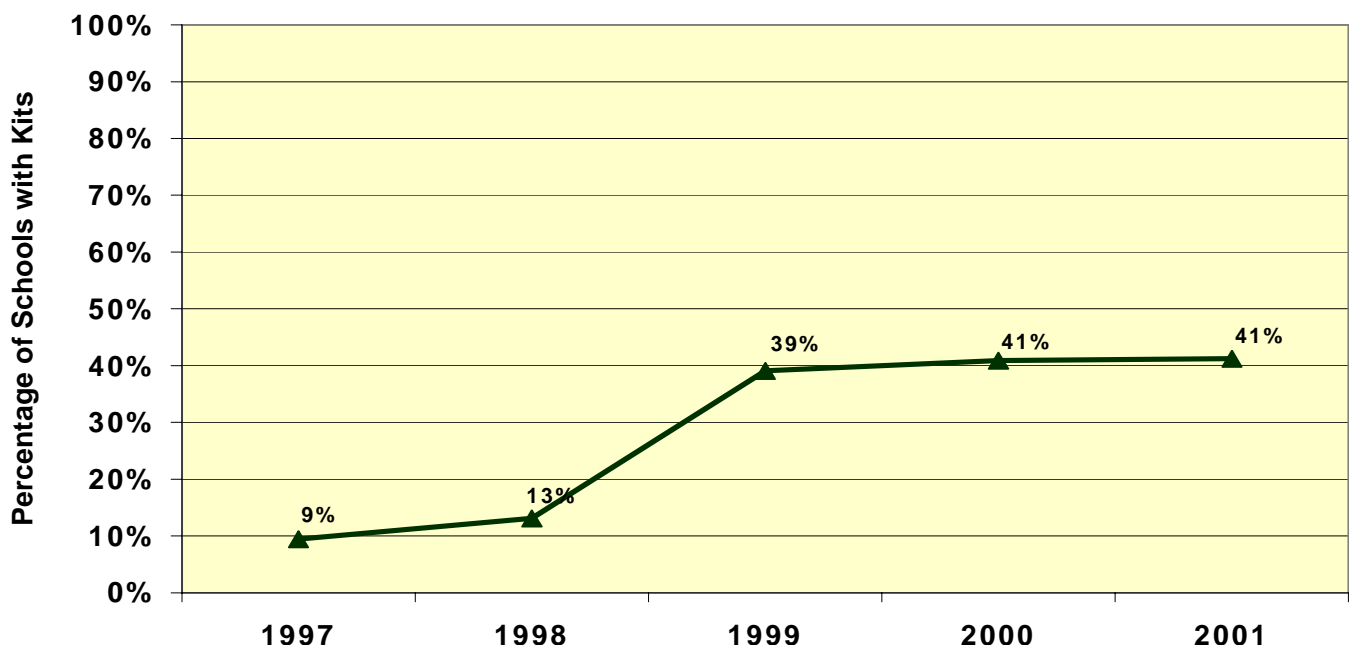
Percentage of Schools Receiving the "Tools for Schools" Indoor Air Quality Program Kit

FFY	Total Number of Candidate Schools	Number of Schools Kits Distributed To	Percentage of Schools with Kits
1997	413	39	9%
1998	389	51	13%
1999	389	152	39%
2000	389	159	41%
2001	393	162	41%

Source: Jeff Eckerd (NRIAQB)

Data are required by the EPA.

Cumulative Percentage of Schools Distributed Indoor Air Quality "Tools for Schools" Program Kits



Percentage of Schools in Compliance with Asbestos Management Plan Regulations

Explanation: Buildings constructed before 1980 may contain asbestos in pipe insulation, structural fireproofing, mechanical areas, and wall plaster. If asbestos-containing building materials (ACMBs) are not properly identified and managed they may be unintentionally disturbed, causing the release of asbestos fibers. ACMBs still exist in Hawai'i's schools. EPA regulations require each school to prepare an Asbestos Management Plan, which documents the presence and condition of ACMBs and specifies provisions for properly managing any ACBM present. Plans are required to contain inspection and re-inspection reports; periodic surveillance reports; response action information; notices sent to parents and employees; designated person information and custodian training documents. Since the program's inception in 1988, over 400 schools have been contacted by NRIAQB staff and informed of this requirement. For the purposes of this measurement, compliance is assumed unless an inspection proves otherwise. The number of schools required to comply changes as new schools open and existing schools are closed.

Implications: The chart shows a decline in compliance since the mid 1990s, likely the result of increased inspections revealing additional non-compliance. Nine out of ten schools have an asbestos management plan, but there is not necessarily a direct correlation between the existence of a plan and its implementation. However, in this past year compliance improved, reflecting both an increase in the implementation of plans in schools with ACMBs and some older school closures as a result of new school construction.

Data Quality: Medium (± 10 -25% confidence).

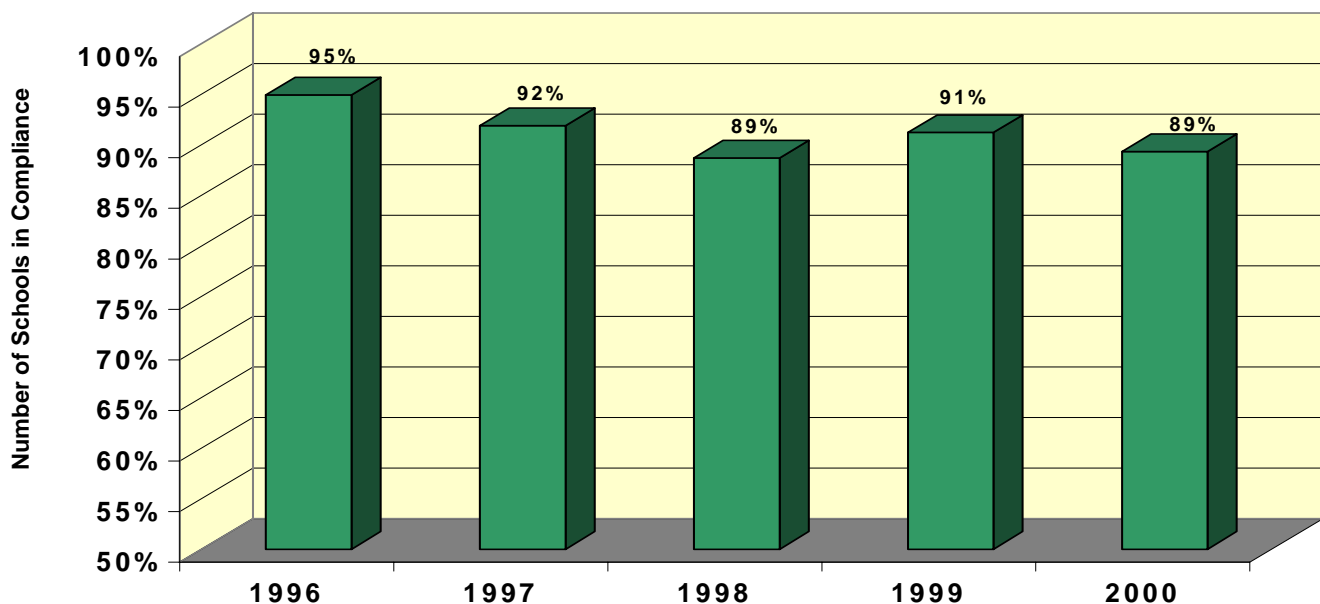
Source: Bobby Lopes (NRIAQB)

Data are required by the EPA.

Percentage of Schools in Compliance with Asbestos Management Plan Regulations

FFY	Total Number of Schools Required to Comply	Number of Schools in Compliance	Percentage of Schools in Compliance
1996	414	393	95%
1997	419	385	92%
1998	389	345	89%
1999	387	353	91%
2000	412	368	89%

Percentage of Schools in Compliance with Asbestos Management Plans





Number of Zoonotic Laboratory Tests of Host Animals for Early Detection or Confirmation of Zoonotic Diseases

Explanation: Of the 4,688 zoonotic laboratory tests conducted on rat, mouse and mongoose sera in fiscal year 2001, 7.3% tested positive. Plague and Murine Typhus are tested serologically while cultural procedures are utilized for Leptospirosis and Salmonella. Serum is the fluid portion of whole blood after it has been allowed to clot. The surveys were conducted largely in residential areas, but included industrial, airport and seaport locations.

Implications: Surveys are done subjectively, as they are conducted in areas where there is a suspected health risk and in selected residential communities. Data may not accurately reflect average statewide infection rates. When a tested area results in a significant positive finding the property owner of the test site is notified and the Vector Control Branch provides follow-up action.

Number of Zoonotic Laboratory Tests of Rodents for Early Detection and Confirmation of Zoonotic Diseases					
FY01	Plague	Murine Typhus	Leptospirosis	Salmonella	Total Tests
Number Specimens Tested	9	1116	1760	1334	4219
Number Positive Findings	0	49	219	74	342
Percent Positive	0.00%	4.39%	12.44%	5.55%	8.11%

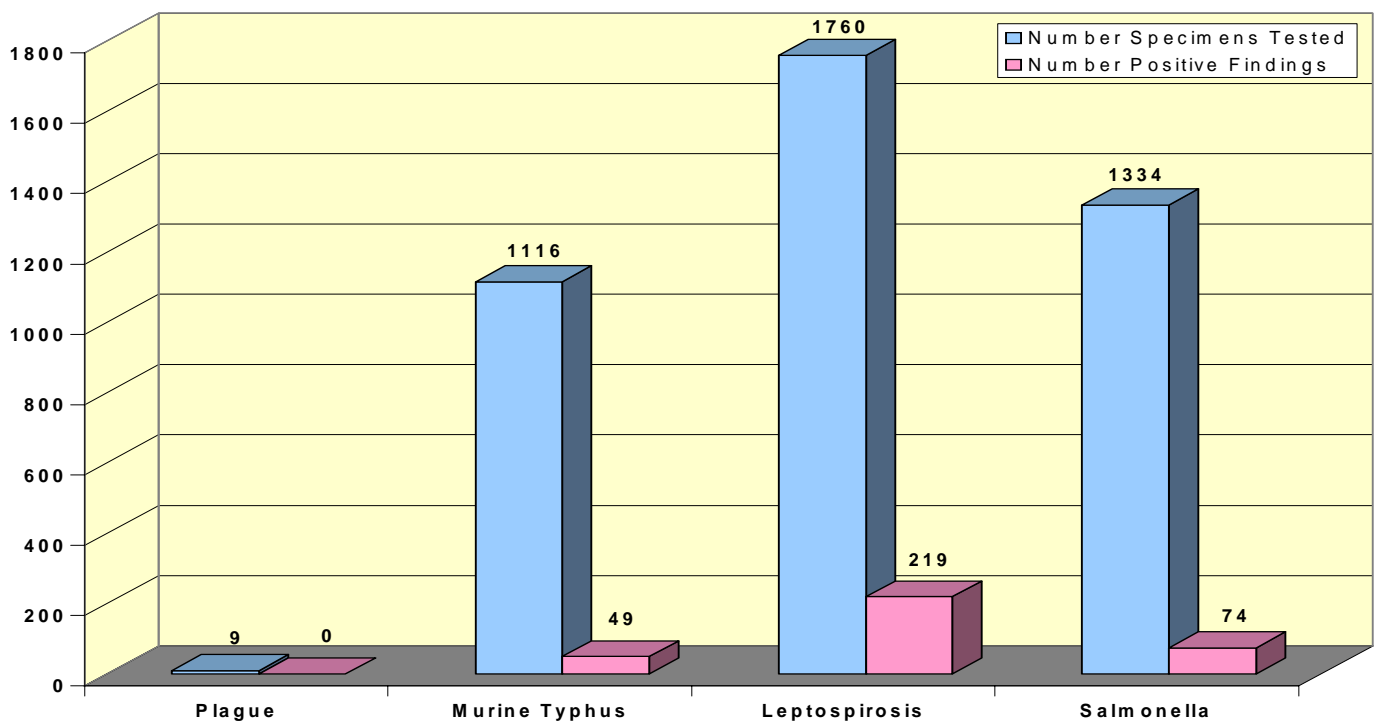
Data Quality:

Medium (± 10 -25% confidence).

Source: Training Research Office (VCB)

Data are not required by the EPA.

Number of Zoonotic Laboratory Tests of Rodents for Early Detection and Confirmation of Zoonotic Diseases





Contaminated Site with Clean-up Completed

Explanation: Progress made in the clean-up of contaminated sites, broken down into three categories, is measured by the date of completion of the clean-up process. The vast bulk of the clean-ups are comprised of leaking underground storage tank (LUST) sites. The next three indicators on the following pages will provide more specific data relating to the progress of each site category.

Implications: The number of known LUST sites has increased significantly since December 1998, when regulations required many older tanks to be removed from the ground, replaced, or up-graded. Although the contents of many of these older tanks were discovered to have leaked into the surrounding soil, the contamination is being addressed quickly.

Data Quality: High (\pm 5-10% confidence).

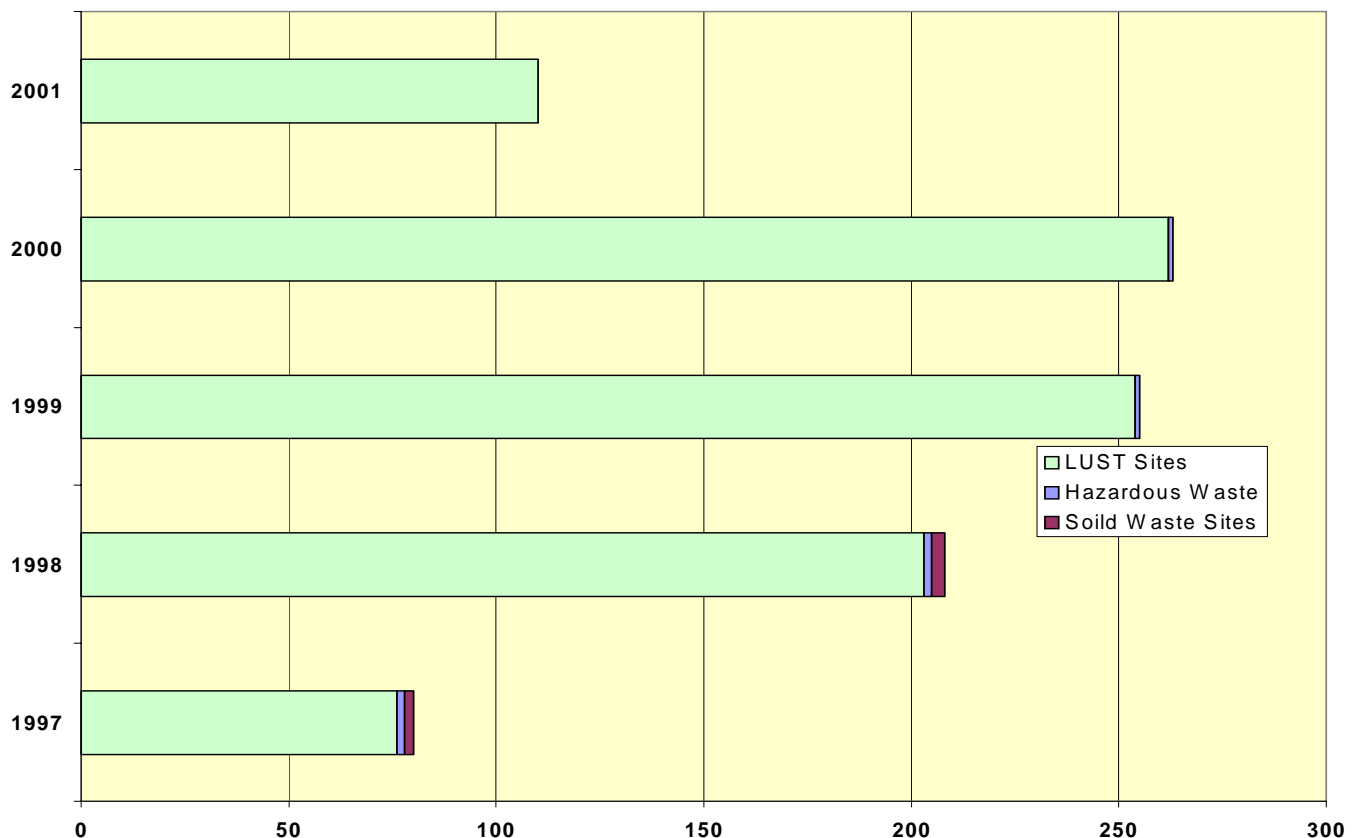
Sources: Grace Simmons (SHWB), Lane Otsu (SHWB), and Greg Olmsted (SHWB).

Data are required by the EPA.

Contaminated Sites Clean-up Data

FFY	Hazardous Waste	Soild Waste Sites	LUST Sites	Total Sites
1997	2	2	76	80
1998	2	3	203	208
1999	1	0	254	255
2000	1	0	262	263
2001	0	0	110	110

Number of Contaminated Sites Cleaned-up





Cumulative Percentage of Leaking Underground Storage Tank Sites with Clean-up Partially Addressed or Completed

Explanation: Of the 1,623 confirmed releases from underground storage tanks from 1986 to 2001, 71% have had 'clean-up' completed. Nineteen percent of the sites have had 'clean up' partially addressed, (i.e., efforts have begun which: manage contaminated soil, remove free product, manage dissolved petroleum, and/or monitor the groundwater or soil), and 10% have yet to be addressed.

Implications: Some of the data for this indicator are included with data listed on the previous page; the data on this page pertains only to LUST sites and includes releases which have received no clean-up activity or which have only had clean-up partially addressed. Clean-ups for this category of contaminated sites has increased, while the number of new releases has decreased. Of the 10% of the sites that have not been addressed, some are recent releases for which the DOH has yet to receive information on clean-up efforts. None of the unaddressed sites constitutes an emergency situation; all emergencies are addressed immediately by the Hazard Evaluation & Emergency response personnel.

Data quality: High
(\pm 5-10% confidence).

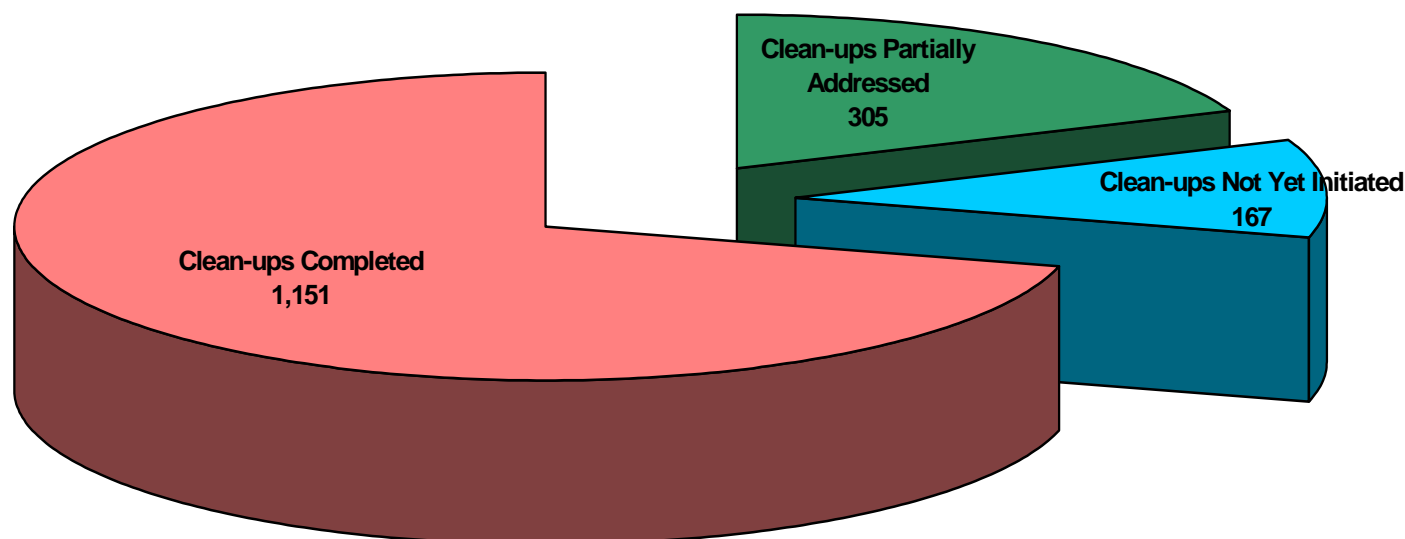
Source: Greg
Olmsted (SHWB).

LUST Site Clean-up Data

Total Tanks	Active Tanks	Closed Tanks	Confirmed Releases	Clean-ups Partially Addressed	Clean-ups Not Initiated	Clean-ups Completed
6,693	1,998	4,695	1,623	305	167	1,151

Data are required by the EPA.

Status of Leaking Underground Storage Tank Sites Cleaned Up as of FY 2001





Quantity of Hazardous Waste Generated in Hawai'i

Explanation: Hazardous waste generation, as presented in this indicator, is reported to EPA by "large quantity generators" biennially in odd years. "Small quantity generators" were included only in the 1995 data, as a result waste generation appears to peak in 1995. Overall, the quantity of waste generated, as shown in this indicator, has ranged from roughly 1,300 to 3,000 tons annually during the period from 1991 to 1999. Hazardous wastes in wastewater have been excluded from the indicator because the data quality for wastewater volumes is particularly questionable, especially since volume was removed as an EPA reporting requirement in 1997. The majority of hazardous wastes in Hawai'i are sent to permitted commercial treatment storage disposal facilities on the mainland, while the recyclable solvents are processed in state. Hazardous waste is defined in 40 CFR 261.3 as waste having any of the four hazardous characteristics: ignitability, corrosivity, reactivity, or toxicity, or a waste specially listed as a substance to be regulated as a hazardous waste. Common examples include paint, battery acid, oil, lead, and waste bleaches.

Implications: Compared to other states, hazardous waste generation has been relatively low in Hawai'i. During the ten year period represented by this indicator, hazardous waste generation appears to be decreasing after a slight increase between 1993 and 1997.

Data Quality: Low (\pm 25-50%) confidence.

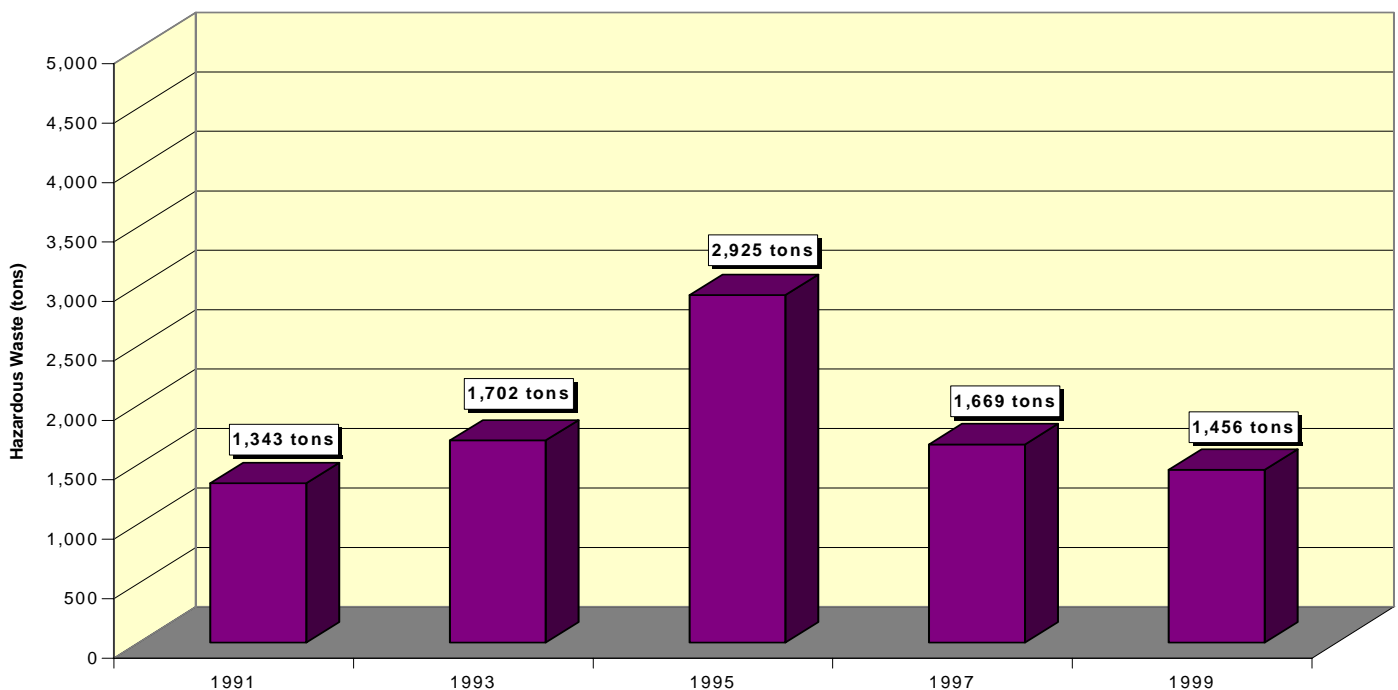
Source: Grace Simmons (SHWB).

Data are required by the EPA.

Hazardous Waste Generation Data

FFY	Hazardous Waste Generated in Tons
1991	1,343
1993	1,702
1995	2,925
1997	1,669
1999	1,456

Quantity of Hazardous Waste Generated in Hawai'i





Percentage of Solid Waste Recycled in Hawai'i

Explanation: The percentage of solid waste diverted from landfills for recycling in Hawai'i is slowly increasing. In 2000, DOH did not receive diversion figures from some recycling facilities, as reporting is voluntary. As a result we can only reflect partial data for this recycling indicator. The amount of solid waste produced each year has not risen significantly; in fact, this past year it decreased slightly. For the purposes of this indicator tires and batteries are included in the 'other' category in the graph below. Amounts diverted do not include waste sent to H-Power for incineration and power generation.

Implications: Hawai'i's legislated goal is 50% solid waste recycling by the year 2000. We fell short of that goal. Hawai'i does not have a large local market for material, so most recycled goods must be shipped out for processing. These shipping costs make it difficult for Hawai'i recycling businesses to compete, especially in a period when the market price for raw recycled materials is low.

Data Quality: 1996 & 2000: Low (\pm 25-50%) confidence; 1997-1999: Medium (\pm 10-25%) confidence.

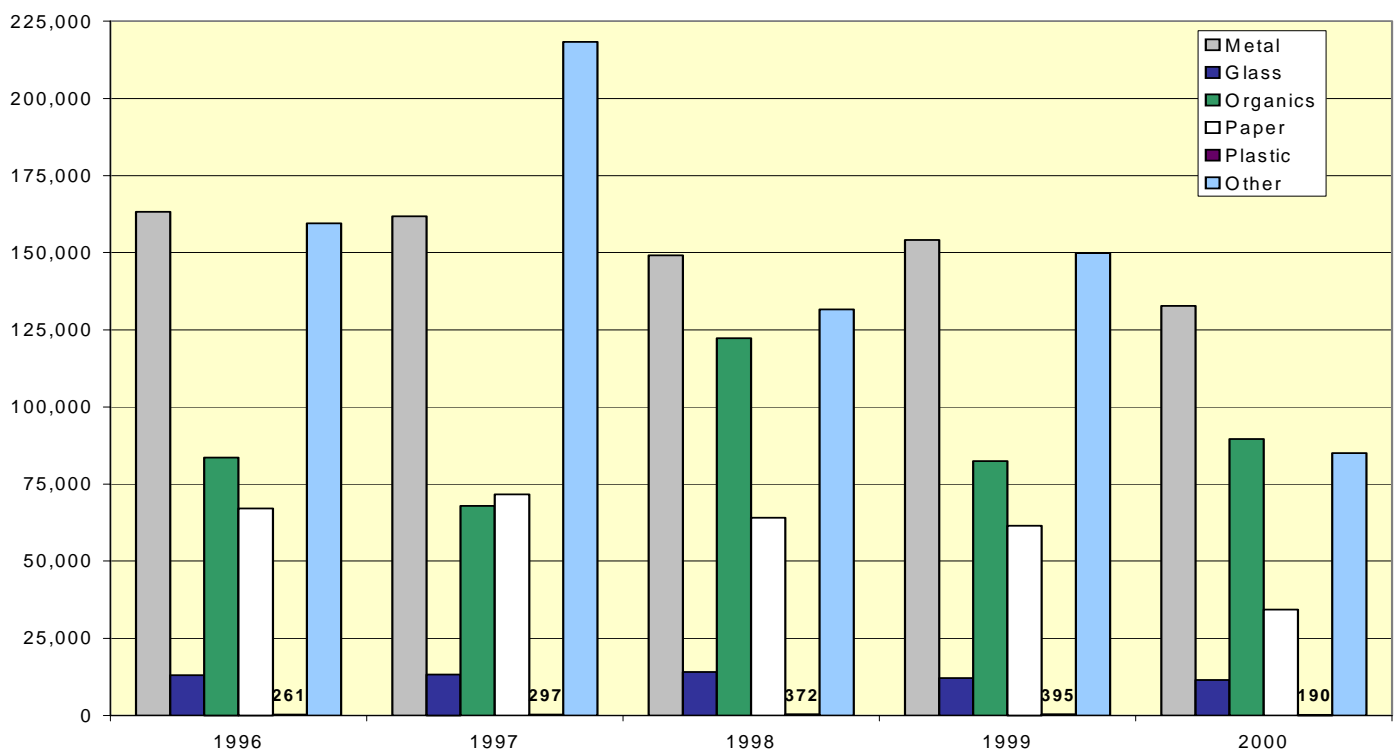
Source: Lane Otsu (OSWM)

Data are not required by the EPA.

Total Solid Waste Recycling Data (in tons)

FFY	Produced Statewide	Disposed Statewide	Diverted Statewide	Percentage Diverted
1996	2,122,000	1,619,000	503,000	23.7%
1997	2,132,000	1,599,000	533,000	25.0%
1998	2,004,000	1,524,000	481,000	24.0%
1999	1,884,477	1,424,005	460,472	24.4%
2000	1,794,496	1,441,000	353,496	19.7%

Tons of Diverted Solid Waste





Oil and Chemical Releases in Hawai'i

Explanation: Any releases of oil or chemicals must be reported to DOH. No clear trend exists in the number of oil and chemical releases from 1996 to 2000. The database currently contains only initial information regarding a release. Follow-up information on releases (including volumes of releases) is not included.

Implications: Hazard Evaluation and Emergency Response office crews respond to roughly 400-500 'spills' each year. Most are minor, a few are major, and some are false alarms. An increase in the number of releases does not necessarily correlate with an increase in damage to the environment. Future tracking and reporting will include volumes of spills in addition to numbers of spills. This tracking system is expected to be operational by the end of fiscal year 2002.

Data Quality: Medium ($\pm 10\text{-}25\%$) confidence.

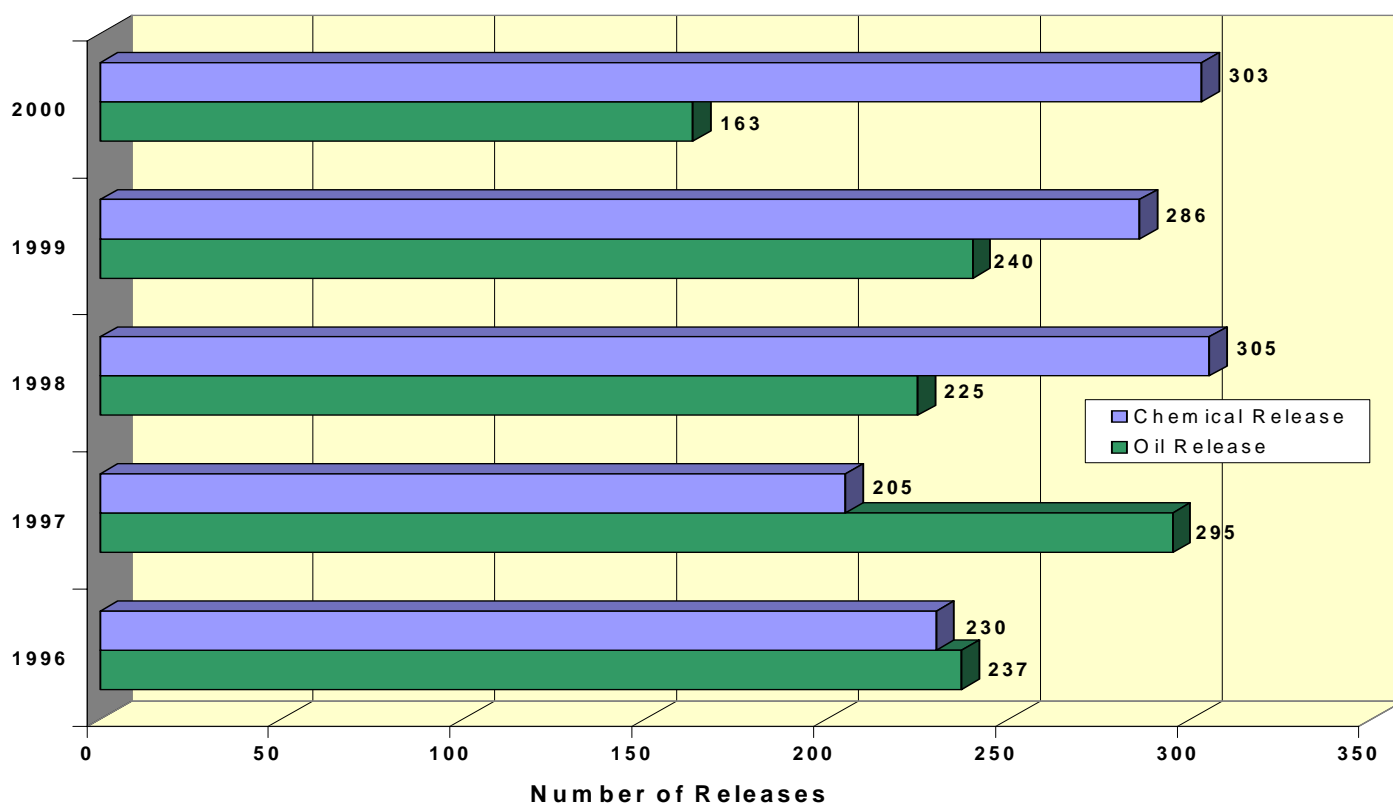
Source: Marsha Graf (HEER).

Data are not required by the EPA.

Oil & Chemical Release Data

FFY	Oil Releases	Chemical Releases
1996	237	230
1997	295	205
1998	225	305
1999	240	286
2000	163	303

Oil & Chemical Release to Land and Water in Hawai'i





Percentage of Hawai'i's Population Served Drinking Water in Compliance with 1994 State and Federal Microbiological and Chemical Maximum Contaminants Levels

Explanation: Ninety-eight to 99.8% of Hawai'i's residents and visitors were served drinking water which met microbiological or chemical standards, called maximum contaminant levels (MCLs). Water that exceeds MCLs is believed to be harmful to human health. Population figures are derived by summing the populations each public system reports. The population served drinking water in exceedance of an MCL is counted for the entire year. In actuality, the exposure is usually for one week or less. This indicator uses the 1994 standards in order to show trends based on a steady baseline. Measuring progress towards a moving target (due to changing MCLs) would make this indicator too complex.

Implications: The compliance rate has consistently stayed above 98% over the last 5 years. A 99.7% compliance rate indicates that at some time during the year, up to 3540 people (0.3% of 1.29 million) were possibly exposed to drinking water above MCLs. In 2000 microbiological violations in one medium sized Big Island water system and one medium sized O'ahu water system decreased the population served water below MCLs. Whenever a violation is found, hand-delivered and/or published notices notify recipients of the problem.

Data Quality: High (\pm 5-10% confidence).

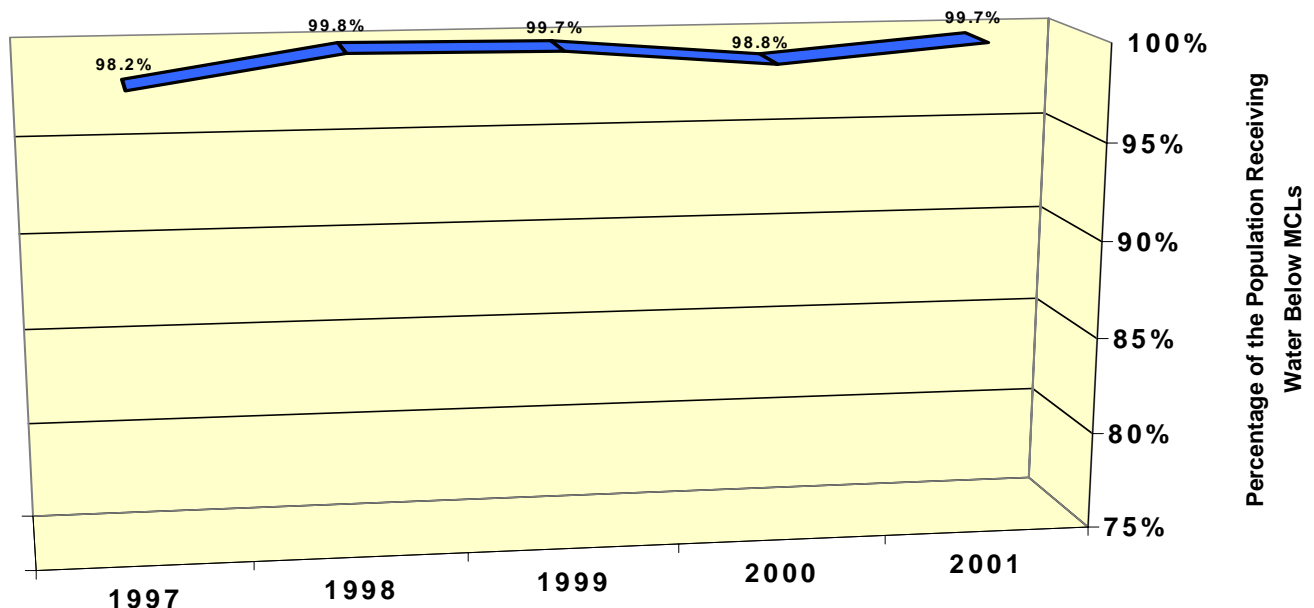
Source: Ann Zane (SDWB)

Data are required by the EPA.

Drinking Water MCL Compliance Data

FFY	Total Population Served Drinking Water	Population Served Water Below MCLs	Percentage Population Served Water Below MCLs
1997	1,334,397	1,310,573	98.2%
1998	1,333,717	1,331,353	99.8%
1999	1,294,772	1,291,099	99.7%
2000	1,291,907	1,277,016	98.8%
2001	1,289,360	1,285,821	99.7%

Percentage of Hawai'i's Population Served Drinking Water in Compliance with 1994 Maximum Contaminant Levels





Cumulative Number of Sanitary Surveys Conducted for Drinking Water Systems in Hawai`i, 1997-2001

Explanation: A sanitary survey consists of a periodic review of the water source, facilities, equipment, operation and maintenance practices and records to verify that a public water system is operating properly. EPA required DOH to conduct 'Sanitary Surveys' of all public water system source, treatment, and distribution operations over a 5 year period. For Hawai`i, that averages 27.4 surveys per year. The SDWB is ahead of the EPA required completion schedule of sanitary surveys of all public water systems.

Implications: The last round of surveys was held from 1988-91, so it is timely for DOH to inspect these water systems again. Within 30 days of each survey, the SDWB submits a sanitary survey report to the purveyor discussing any deficiencies and recommendations. The SDWB also requests a response from the purveyor within 30 days of receiving the report. When problems are found during surveys, the risk of water contamination is assessed. If the problem poses an imminent risk of contamination to the source or finished water, the SDWB will direct the purveyor to promptly correct the problem.

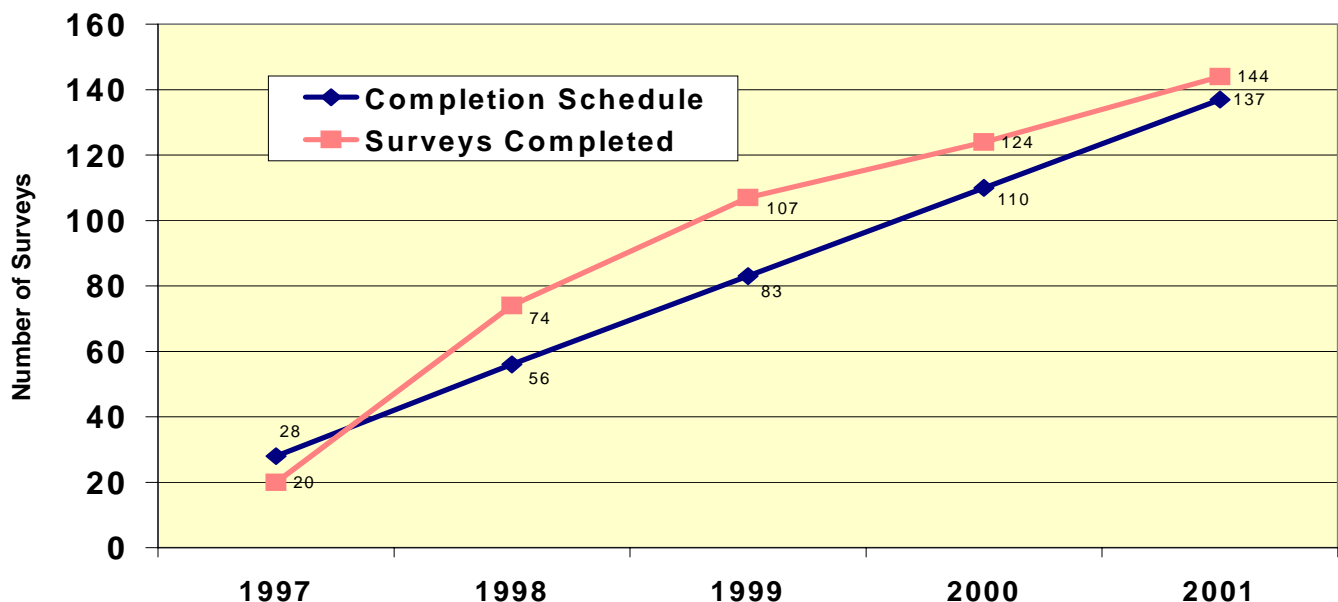
Data Quality: High (\pm 5-10% confidence).

Source: William Wong (SDWB).

Data are required by the EPA.

FFY	Target Number of Systems to Survey	Surveys Completed Annually
1997	28	20
1998	28	54
1999	27	33
2000	27	17
2001	27	20

Drinking Water Sanitary Surveys Completed Compared to EPA-Required Completion Schedule





Percentage of Underground Injection Wells in Compliance with State and Federal Regulations

Explanation: The percentage of underground injection well facilities in compliance with state and federal regulations (that is, those with a current permit) for the calendar year 2001 has decreased about 7% since the year 2000, from 61% to 54%. The majority of wells not in compliance with the regulations were drainage injection wells used for rainfall runoff disposal. However, contributing to the decrease in compliance were expired permits for sewage injection wells, wells for sewage disposal, as well as commercial and industrial-related injection activity, are given a higher priority and have a higher compliance rate, approximately 75%. Permit renewals for sewage, commercial, and industrial injection will be pursued first over permit renewals for drainage injection.

Implications: Drainage injection wells pose a relatively low potential for environmental contamination, as compared to industrial or sewage related facilities. However, for counting purposes, all facilities are weighed equally.

Data Quality: High (\pm 5-10% confidence).

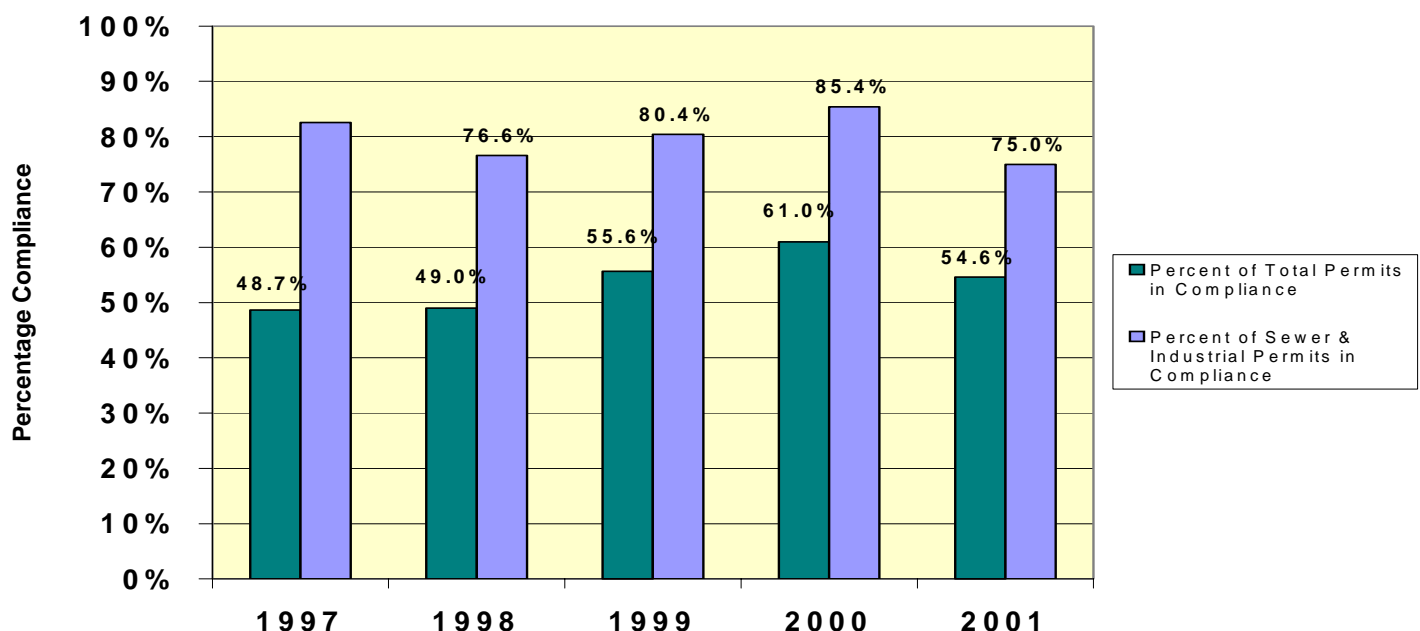
Source: Chauncey Hew (SDWB)

Data are required by the EPA.

Percentage of Underground Injection Wells in Compliance with State and Federal Regulations

FFY	Total UIC Permits	Total Expired Permits	Percent of Total Permits in Compliance	Percent of Sewer & Industrial Permits in Compliance
1997	483	248	48.7%	82.6%
1998	504	257	49.0%	76.6%
1999	559	248	55.6%	80.4%
2000	574	224	61.0%	85.4%
2001	590	268	54.6%	75.0%

Percentage of Underground Injection Well Facilities in Compliance with State and Federal Regulations





Beach Closure/Warning Days Annually Due to Sewage or Water Pollution

Explanation: This indicator reflects the number of days each calendar year that DOH required warning or closure signs to be posted alongside recreational coastal waters due to sewage or water pollution. Overall, 1997 seems to be the worst year for closures/warning with subsequent decreases in the following years.

Implications: In 1996, DOH published a goal of five beach closure/warning days posted per year by 2000. Achieving that goal has proved to be difficult as some beach postings are largely precautionary measures, as not all reported releases resulting in beach posting are confirmed.

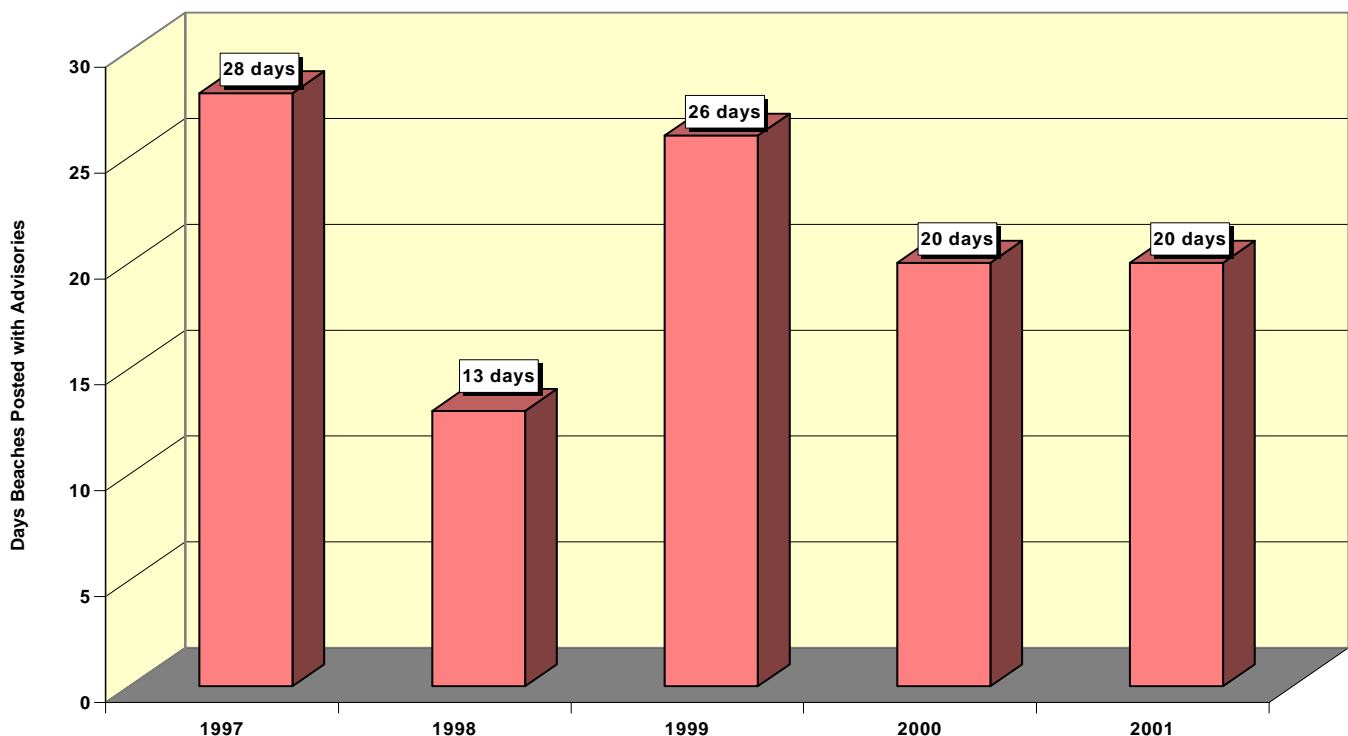
Data Quality: Medium ($\pm 10\text{-}25\%$) confidence.

Source: Ann Teruya (CWB), Natural Resources Defense Council (NRDC) web site and the OEQC 1998 Annual Report.

Data are not required by the EPA, but are reported in DOH's biennial 305(b) report.

Beach Closure Days Annually Due to Pollution	
Calendar Year	Days beaches closed per year
1997	28
1998	13
1999	26
2000	20
2001	20

Beach Closures Days Due to Sewage or Water Pollution





Number of Impaired Streams Listed, 2001

Explanation: In 2001, EPA re-evaluated its 1996-1997 stream quality assessment (87 streams surveyed) and other historic information to revise our list of streams with impaired water quality. Of the 376 known perennial streams in Hawai'i, 14% (54 streams) are now included on the revised State of Hawai'i Clean Water Act 303(d) list for 1998. This list, and an explanation of the evaluation methods used, may be viewed at www.epa.gov/region09/water.tmdl. For each stream on the impaired waters list, EPO must determine current pollution loads and establish the load reductions necessary for the stream to meet water quality standards. In May 2001, EPA approved load reductions (Total Maximum Daily Loads, or TMDLs) for nitrogen, phosphorous, and sediments in Waimanalo Stream (Oahu), and EPO recently submitted TMDLs for Kawa Stream (Oahu). TMDL studies are in progress for Kaneohe and Waialeale streams (Oahu) and will begin in 2002 for six remaining streams that drain into Pearl Harbor (Oahu) and for Nawiliwili and Huleia streams on Kauai. There are also 56 listed coastal water needing TMDLs.

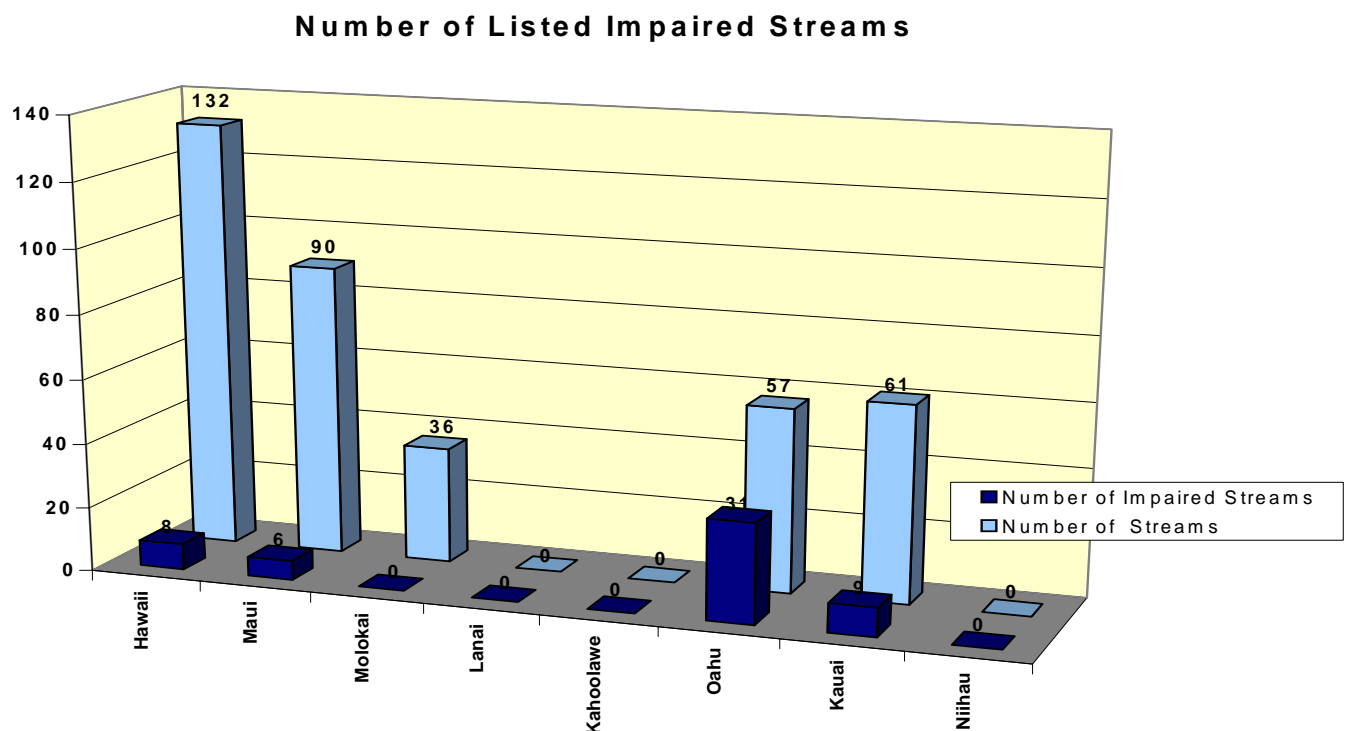
Implications: In the 2000 edition of the Indicators of Environmental Quality the EPO recommended improving efforts to systematically survey Hawai'i streams on a permanent, rotating basis. Results from these improved surveys and public nominations are now under review as EPO prepares its year 2002 draft of the impaired waters list for EPA approval. As these surveys continue, trend data will become available that help to reduce the uncertainty and bias influencing previous assessment efforts. One part of the improved survey efforts, EPO's stream bioassessment program, is used to score the biological integrity of streams and has been completed in conjunction with TMDL studies of Waimanalo, Kawa, and Kaneohe streams.

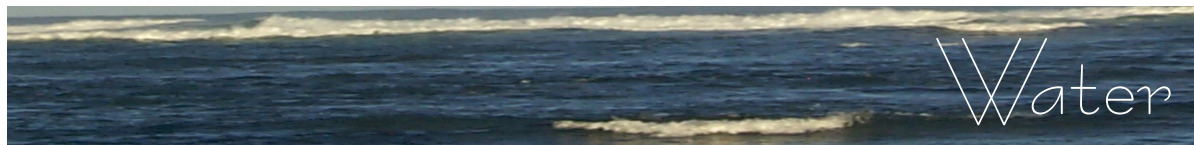
Data Quality: Medium (\pm 10-25%) confidence.

Source: David Penn (EPO).

Data are required by the EPA.

Number of Impaired Streams Listed		
Island	Number of Impaired Streams	Number of Streams
Hawaii	8	132
Maui	6	90
Molokai	0	36
Lanai	0	0
Kahoolawe	0	0
Oahu	31	57
Kauai	9	61
Niihau	0	0
TOTAL	54 (+ 1 lake)	376





Percentage of Wastewater Recycled Annually

Explanation: Wastewater recycling (or reuse of water treated to a level appropriate for irrigation purposes) has risen from roughly 12 million gallons per day in 1996 to 20.2 million gallons per day in 2000, representing an increase of 5.3% over the past five-year period.

Implications: DOH had plans to encourage reuse of 25% of all wastewater. Recent developments make that a much less likely goal. Without more rapid development of reuse options by large treatment plant owners (i.e. the counties and military), there will not be a significant increase in large-scale reuse.

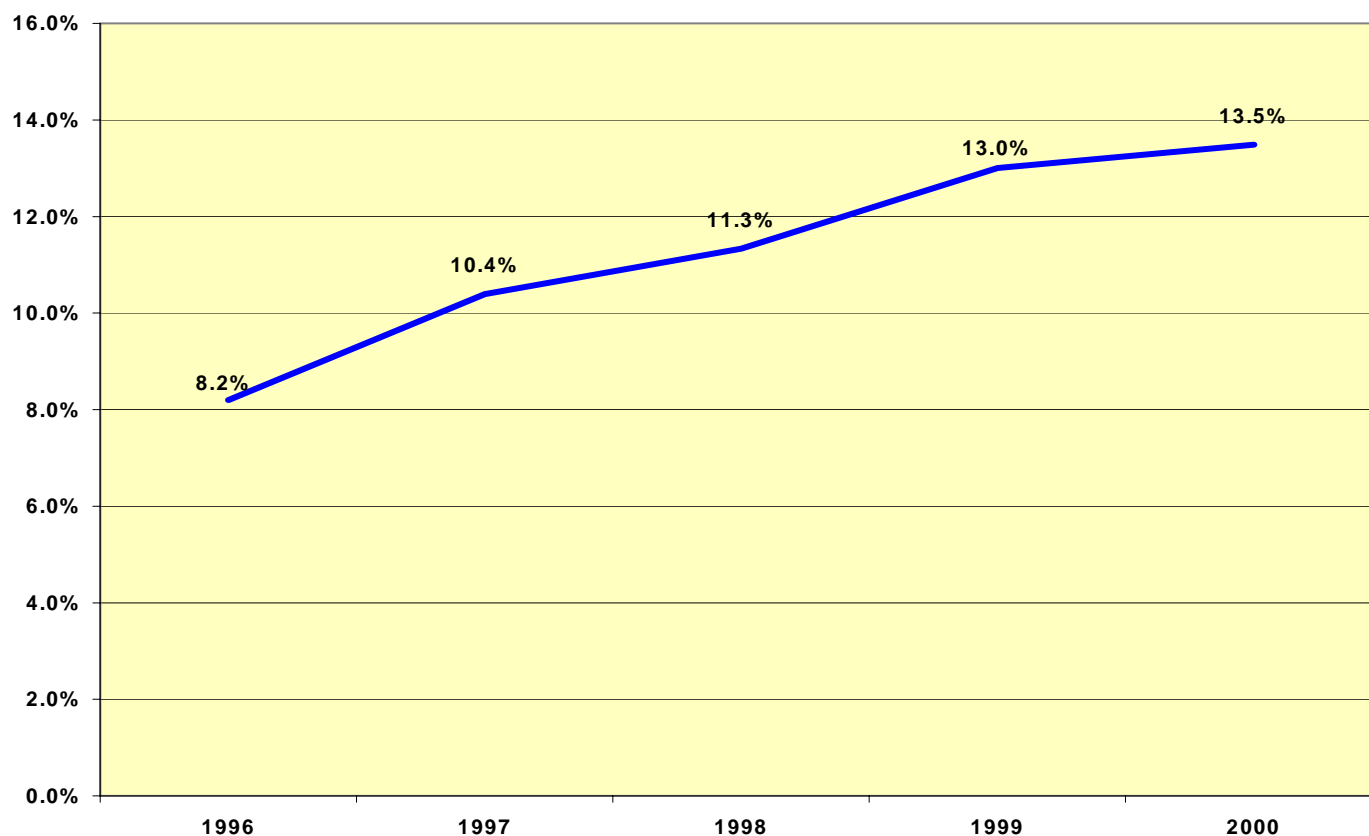
Data Quality: Medium (± 10 -25%) confidence.

Source: Tomas See (WWB).

Data are not required by the EPA.

Wastewater Reuse Data			
FFY	Total Wastewater Treated (MGD)	Wastewater Reused (MGD)	Percentage Reused
1996	150.1	12.3	8.2%
1997	150.1	15.6	10.4%
1998	150.0	17.0	11.3%
1999	150.0	19.5	13.0%
2000	150.0	20.2	13.5%

Percentage of Wastewater Reused Annually





Wastewater Treatment Plant Operation & Maintenance Compliance Records

Explanation: Slightly more than half of Hawai'i's wastewater treatment plants show full compliance when inspected by the Wastewater Branch staff. Any operation and maintenance deficiencies, effluent violation or permit violation warrant an unsatisfactory rating.

Implications: The 2000 compliance rate decreased by 12% because private plants that are typically in compliance were not inspected this year due to staff shortage. As a result, the stated goal of the WWB of 95% compliance by the year 2000 was not achieved. The WWB staff believe operation and maintenance compliance leads to fewer sewage spills because well-maintained equipment breaks down less often. A major cause of the unsatisfactory ratings is the number of underground injection permits (which are covered by the O&M inspection) that have expired (see page 19 for a discussion of the underground injection permit program).

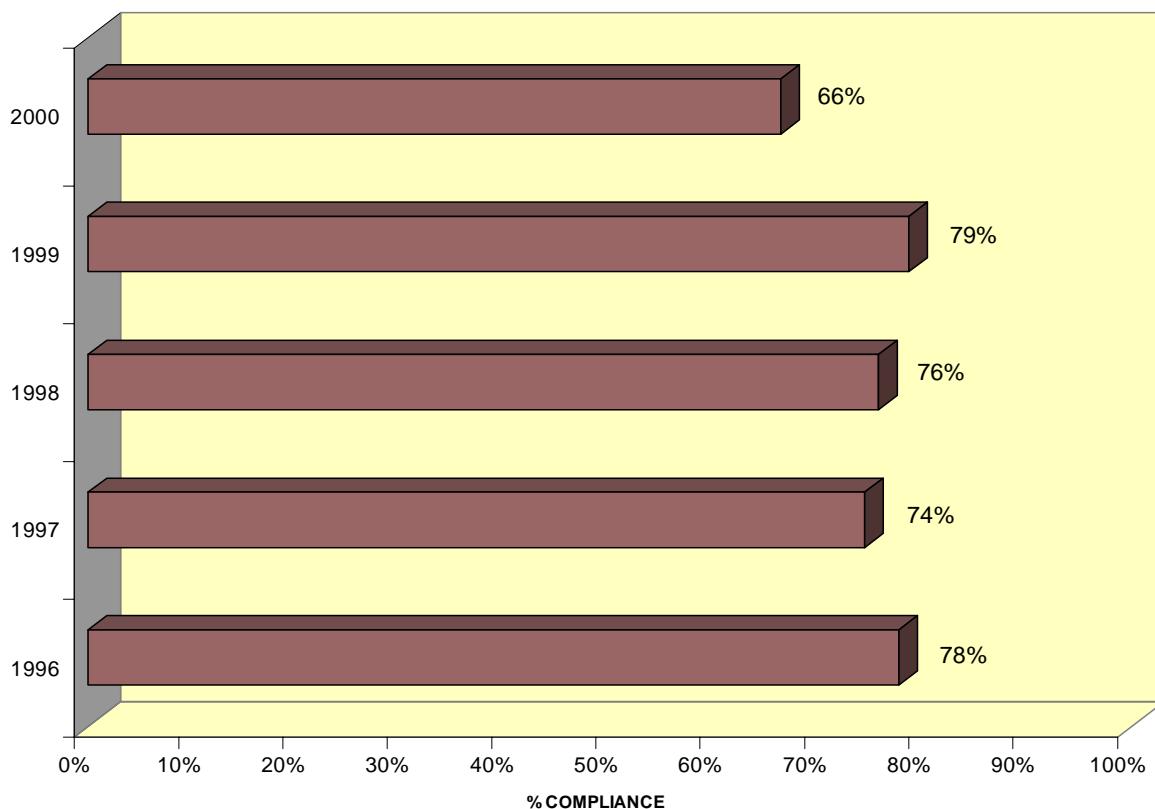
Data Quality: High (\pm 5-10% confidence).

Source: Marshall Lum (WWB).

Data are not required by the EPA.

Wastewater Treatment Plant O&M Data			
FFY	Number of Plants Inspected	Rated Unsatisfactory	Percent in Compliance
1996	103	23	78%
1997	176	45	74%
1998	169	41	76%
1999	164	35	79%
2000	113	38	66%

Wastewater Treatment Plant Operation & Maintenance Compliance Record





Annual Enforcement Report Summary

Explanation: DOH publishes a quarterly inspection and enforcement report similar to the annual report (below). The quarterly reports summarize notices of violation of the formal actions taken, describe the nature of the violation, the party involved, and the fine assessed, if any.

Implications: The table below shows a tally of the inspections and responses conducted by DOH pollution control program personnel during the period from October 2000 through September 2001. Formal and informal enforcement actions, and the settlements that arose out of those actions, are counted as well. Inspections and enforcement actions are listed by program area. A tally of the fines originally issued, the fines settled, and the fines collected during this time period are listed. Many fines are collected on a payment plan basis over time; as a result the chart does not accurately reflect delinquencies. In addition the number of other penalties, such as supplemental environmental projects and the number of the completed projects are listed.

Data Quality: Medium ($\pm 10\text{-}25\%$ confidence).

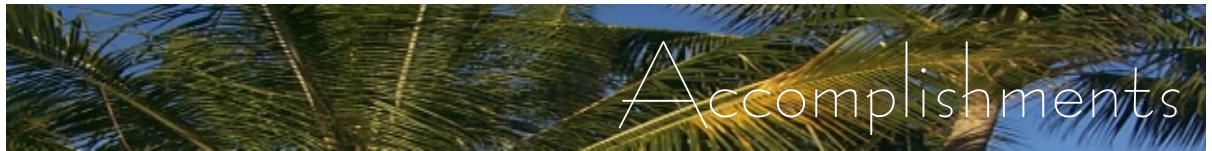
Source: Melissa O'Connor-Fariñas (EPO)

Data are not required by the EPA.

	Inspections / Responses	Informal Actions ¹	Formal Actions ²	Formal Actions Concluded	Formal Actions Pending	Fines Originally Issued	Fines Settled	Fines Collected
	October 2000 - September 2001	October 2000 - September 2001	October 2000 - September 2001	October 2000 - September 2001	Total as of September, 2001	Total \$ as of September, 2001	Total \$ as of September, 2001	Total \$ as of September, 2001
Clean Air Branch								
Fugitive Dust	623	43	0	0	0	\$0.00	\$0.00	\$0.00
Noncovered Sources	114	9	4	1	5	\$441,155.00	\$12,400.00	\$25,500.00
Covered Sources	229	45	4	2	2	\$117,150.00	\$0.00	\$99,250.00
Agricultural Burning	322	8	0	0	0	\$0.00	\$0.00	\$0.00
Open Burning	136	21	0	0	1	\$0.00	\$0.00	\$0.00
Others	316	9	0	0	0	\$0.00	\$0.00	\$0.00
Solid & Hazardous Waste Branch								
Underground Storage Tanks	195	48	0	0	0	\$68,200.00	\$0.00	\$45,050.00
Hazardous Waste	106	24	6	9	4	\$585,256.00	\$601,900.00	\$447,472.50
Solid Waste	289	44	6	5	9	\$129,350.00	\$24,300.00	\$33,200.00
Clean Water Branch								
Permitted Discharges (NPDES)	115	21	4	1	2	\$0.00	\$10,000.00	\$20,000.00
Non-permitted Discharges	242	24	6	3	4	\$73,482.00	\$40,846.00	\$39,621.00
Water Quality Certifications	5	4	0	0	0	\$0.00	\$0.00	\$0.00
Wastewater Branch								
Wastewater Treatment Plants	155	3	1	0	3	\$40,000.00	\$130,000.00	\$130,000.00
Individual Wastewater Systems	105	53	2	8	8	\$1,500.00	\$10,000.00	\$10,325.00
Animal Waste	7	3	1	0	1	\$600,000.00	\$0.00	\$0.00
Other	145	9	0	0	0	\$0.00	\$0.00	\$75.00
Safe Drinking Water Branch								
Public Water Systems	18	14	0	0	2	\$0.00	\$0.00	\$1,000.00
Wells - Underground Injection Control	41	34	1	0	2	\$51,900.00	\$21,525.00	\$30,375.00
Hazard Evaluation & Emergency Response								
Oil Spills	8	4	0	0	0	\$0.00	\$0.00	\$0.00
Hazardous Waste Releases	49	5	0	0	0	\$0.00	\$0.00	\$0.00
Noise, Radiation, & Indoor Air Quality Branch								
	0	1	2	5	1	\$167,600.00	\$42,000.00	\$19,500.00

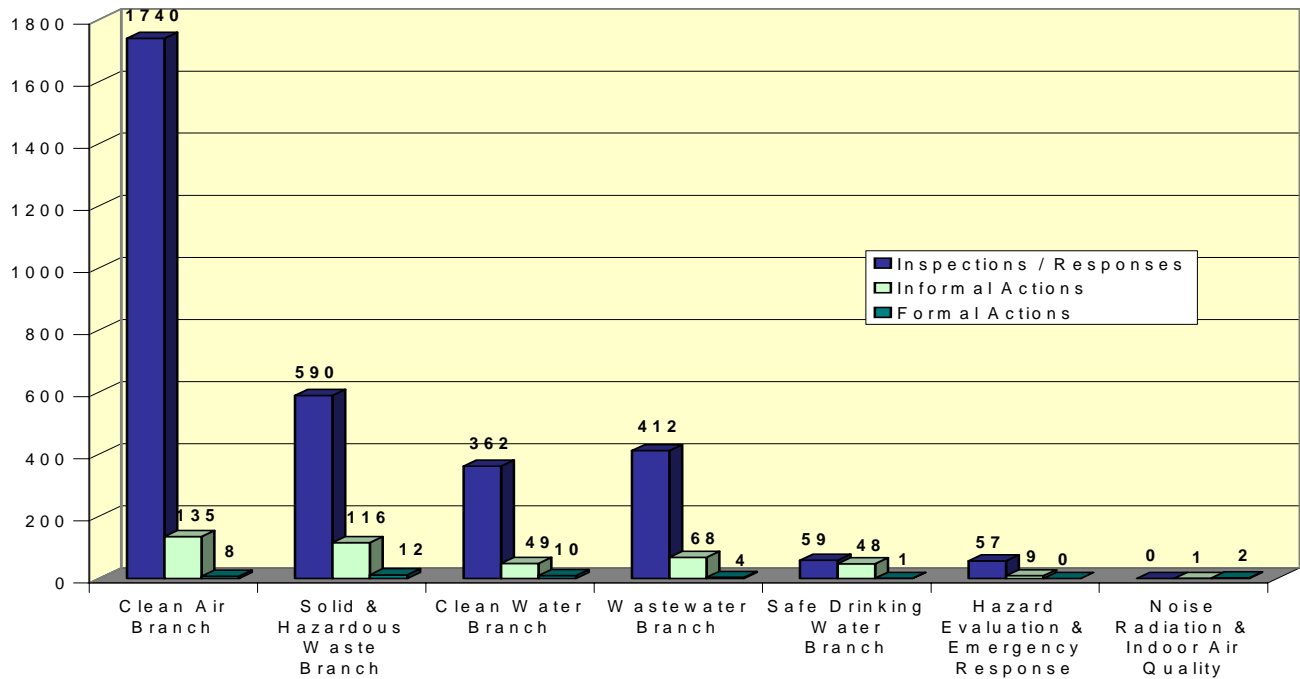
¹ Informal actions generally cover less serious issues such as small infractions by individuals, or violations of permit technicalities which do not directly impact environmental quality. Specifically, letters warning a person or entity that they are violating environmental laws, and normally requiring corrective action by a specified deadline. Field citations are also included in this category.

² Formal actions generally cover any serious violation and repeat or continued violations of permit technicalities. Unsuccessful informal actions lead to formal actions. Specifically, formal actions case" proceedings which typically include a formal notice of violation and an order. Orders often require corrective action, reports, and payment of a penalty. Administrative "trials" may be held.

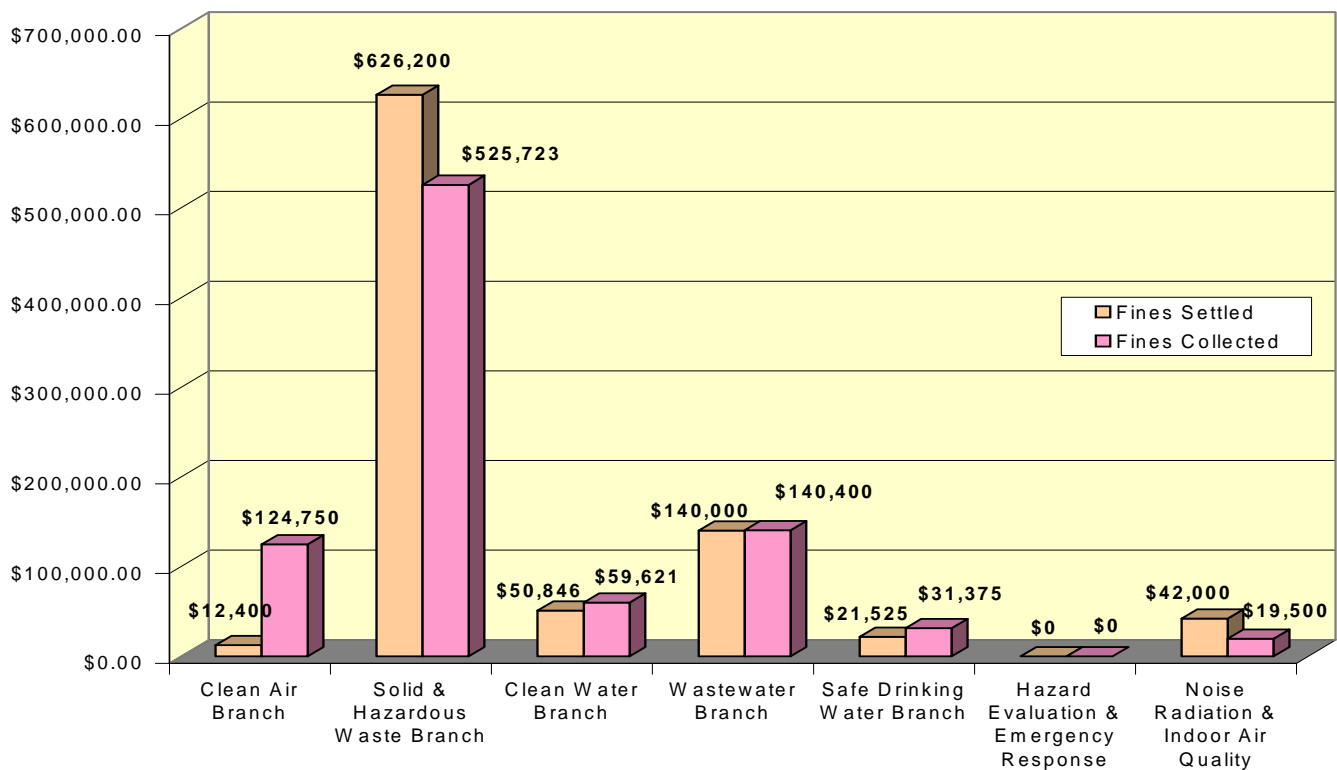


Annual Enforcement Report Summary (Continued)

**Inspection/Responses and Actions Taken
by Branch for October 2000 - September 2001**



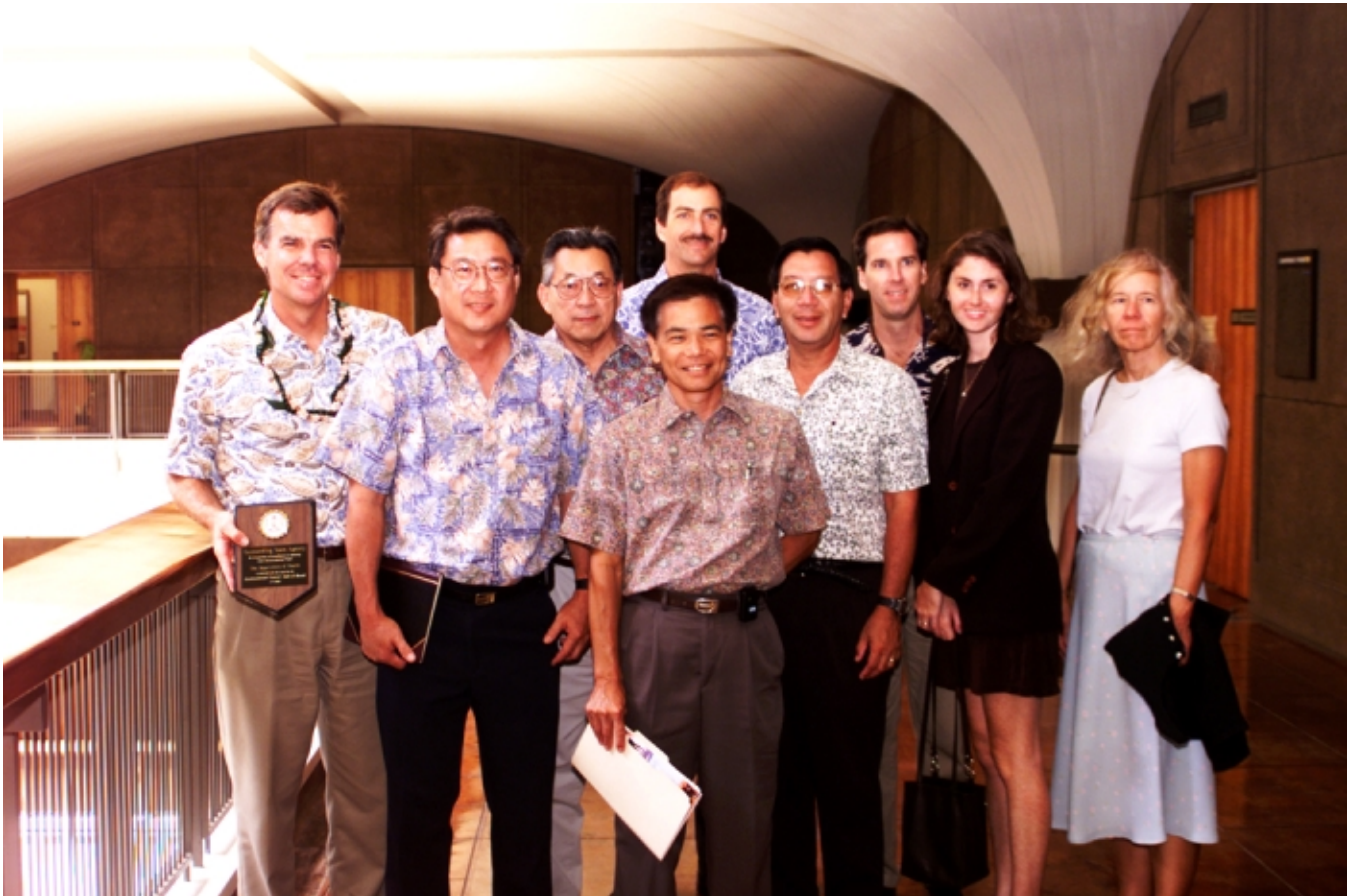
Fines Settled and Fines Collected by Branch for October 2000 - September 2001



Accomplishments

Environmental Council Award

Explanation: On June 13, 2001 DOH was recognized by the Environmental Council for excellence in achieving its goals. The Environmental Council is a fifteen-member citizen board appointed by the Governor to advise the State on environmental concerns. Created in 1970, the Council is empowered to monitor the progress of state, county, and federal agencies' environmental goals and policies. In a report card each year, the Environmental Council advises state policy makers on important issues affecting Hawai'i's environment.



From Right to Left: Dr. Bruce Anderson, Director of Health, Thomas Arizumi, Environmental Management Division Chief, Eugene Akazawa, Clean Water Branch, Wilfred Nagamine, Clean Air Branch Chief, Gary Gill (back) Deputy Director for Environmental Health, Denis Lau, Clean Water Branch Chief, Patrick Felling, Compliance Assistance Office, Melissa O'Connor-Fariñas, Environmental Planning Office, and June Harrigan, Environmental Planning Office Manager.